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ABSTRACT

Based on the learning theories of Benjamin S. Bloom, the program described in this report aims to help students develop basic skills for success in college work. The program, created for Virginia Highlands Community College, centers around English and mathematics learning laboratories. All students can enroll in regular college level courses, but those with weak academic backgrounds or low entrance examination scores also participate in one or more laboratories. There the student can master the course objectives at his own rate and with the help of a variety of instructional aids. Advantages of this program include: (1) the students using the labs were not segregated from other students; (2) the lab students were given a clear diagnosis of their learning problems and the measurable objectives which they had to master; and (3) lab students received academic credit toward their graduation rather than having to take non-credit "remedial" courses. In general, students using the labs, either for one term or for the whole first year, had higher GPA's at the end of the year. The statistical information given, however, is used to illustrate trends and not to document conclusions. (LP)

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AFTER THE OPEN DOOR: AN APPROACH TO DEVELOPMENTAL EDUCATION

George B. Vaughan
and
Donald E. Puyear

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PREFACE

The reader should be apprised of the fact that the following is presented as a model for developmental education that evolved through one college's attempt to meet the demands of its students. The statistical information is used to illustrate trends and not to document conclusions. Since there was no control group and since the samples are relatively small, the authors believe that further documentation is needed before definite conclusions can be reached. However, the trends observed through the use of this approach are highly encouraging and therefore the same basic approach continues to be used, and, beginning with the fall quarter 1972, it will be used in at least one additional community college in Virginia.

The reader should also be informed that the approach discussed in the following pages does not address itself to that part of a developmental program designed to furnish prerequisites. The providing of prerequisites in subjects not previously taken by students should be treated, the authors believe, in the same manner as any other course at the college; that is, prerequisites are not "remedial" in the sense that students taking them necessarily have weaknesses that need to be corrected. In fact, students enrolled in prerequisites may or may not profit from some of the approaches presented in the following pages.

The authors wish to thank Jay L. Chronister, Director, Center for Higher Education, and Robert H. Pate of the Counseling Education Department of the University of Virginia, for assisting the faculty and administration of Virginia Highlands Community College in writing assessable objectives for all courses. They both followed the development of the approach presented in the following pages and were kind enough to offer their comments on the completed manuscript.

George B. Vaughan, President*
Mountain Empire Community College
Big Stone Gap, Virginia

Donald E. Puyear, President
Virginia Highlands Community College
Abingdon, Virginia

*Vaughan was Dean of Instruction at Virginia Highlands Community College before assuming his present position.

AFTER THE OPEN DOOR: AN APPROACH TO DEVELOPMENTAL EDUCATION

by

George B. Vaughan and Donald E. Puyear

Benjamin S. Bloom has written what may some day be viewed as the community college's Magna Carta, if not indeed its manifesto. His *Learning for Mastery* [1] has provided additional means whereby the community colleges can not only boast of their open doors, but can also keep them open. In its first year of operation, Virginia Highlands Community College in Abingdon, Virginia, built its developmental program around the concepts developed in Bloom's mastery thesis.

In his paper, Bloom sets forth the belief that most students can master a subject if given enough time and guidance and that further, in most cases, a student's past performance in a subject represents a level of achievement, not of aptitude. Virginia Highlands accepts these two tenets and, as a result, during the first year of operation, its faculty and administration have engaged in an intensive in-service training program devoted to examining their own concepts of mastery and to writing specific objectives for each course offered at the college.

The college is a member of the rapidly expanding Virginia Community College System. Like the other colleges in the system, Virginia Highlands is dedicated to offering a comprehensive program of post-high school education. Certainly the admission process would be simplified if all students chose curriculums for which they have been prepared on entering college. This, however, is not the case. Many students come to Virginia community colleges with the understanding that they may prepare for entry into certain curriculums *after* enrollment. The college then has an obligation to prepare those who, for a number of reasons, need additional academic preparation before being in a position to succeed in their chosen curriculum. Thus, a commitment to developmental education is necessarily included in the comprehensive approach of the community college.

Developmental education in the Virginia Community College System encompasses the two generally accepted functions of furnishing students with the opportunity

to obtain course and curriculum prerequisites where they have never had previous courses and of providing academically weak students with the opportunity to correct their deficiencies (4:VIII).*

Since most students in the degree curriculums at Virginia Highlands are high school graduates, its developmental education program is aimed at strengthening those who, for whatever reason, are not performing at the minimum criterion entry level for freshman mathematics and English composition.

In evaluating entering freshmen, the counselors, administrators, and selected faculty members at the college were faced with a dilemma. Should the academically weak students (based on past performance and entrance tests) be placed in the traditional "foundations program," which would work toward strengthening them academically and prepare them for *entry* into the courses required for completion of their degrees? In most instances, this approach offers no credit toward graduation[3] , and would indeed offer none at Virginia Highlands. Foundations programs often last a full academic year. Unfortunately, but understandably, a year without credit toward graduation is often deadening to the initiative and devastating to the ego. The alternative appeared to be to place the academically weak students in the required courses and let them "sink or swim." Both approaches were rejected, however, as potentially unsound educationally and damaging psychologically. A third approach was instituted.

PLACING THE STUDENTS

At Virginia Highlands *all* students who meet the necessary prerequisites in English and mathematics are placed in the freshman courses needed for their two-year degrees. However, those students who show deficiencies in either or both of the two areas are enrolled in laboratory courses designated as English or Mathematics 99

*The authors, like Roueche, agree that the functions of providing prerequisites and strengthening weaknesses should not be lumped together. However, unlike Roueche, we would prefer to consider the strengthening of weaknesses in areas already covered as remedial education; the providing of prerequisites would then be developmental work. However, for the purpose of this paper, the two functions will be treated under the heading of developmental education. They are treated in this manner in the Virginia Community College System. For a brief discussion of Roueche's views on the subject, see his monograph, Item #4 in the Bibliography.

(Lab 99). Those students who scored below the twenty-fifth percentile on the Comparative Guidance and Placement program (CGP) *and* who had a high school grade point average in either mathematics or English of "C" or less, were automatically placed in Lab 99 along with their regular mathematics or English class. Lab 99 is taken for credit. (This credit, while constituting a portion of the student's and instructor's credit load, does not count toward graduation nor is it figured into the student's total grade point average.) Thus, it is unlikely that an academically weak student will overextend himself by signing up for additional courses above the eighteen credit-hour maximum.

It should be noted that had Virginia Highlands chosen to use a more traditional approach to developmental education, most of these Lab 99 students would have been enrolled in the developmental curriculum. Thus, many would have spent a year "getting ready" for the English and mathematics courses needed for graduation.

With some students, voluntariness played a part in their placement. (Student choice played the major role for a number of them when the decision was made whether to continue in the laboratory section.) Some adults who had high grades in secondary school chose to enroll in Lab 99 as "insurance" against failure until they readjusted to the academic scene. Other students who felt that they needed additional help enrolled in the lab sections as they desired. However, most students were placed in Lab 99 based on the criteria mentioned above. Therefore, in relationship to the rest of the student body at Virginia Highlands, they were by definition "high risk" students.

DROPPING "OUT" AND "IN"

Once a student was placed in a section of Lab 99, he was officially enrolled in it until the end of the quarter. (The amount of time spent in the lab was determined by the progress or lack of progress he made toward completing the objectives of the course.) A student could "drop out" of a lab at the end of any quarter, however, if he was making satisfactory progress toward mastering the objectives of the course. Mastery was defined as making a grade of "C" or better. Counselors encouraged, but did not require, those students making a "C" to continue the lab section. Any student making less than a "C" was required to continue the lab section. If a student made a "B" or better, he was encouraged to drop Lab 99 from his schedule for the next quarter and to enroll in another course required by his

curriculum or to take an elective course. It was made clear to each student that if he chose to drop 99 and later found himself progressing at a less than satisfactory rate, he could then resume the lab. This meant that, if he had added a course, he would have to drop it in order to take the lab. Thus, *no students* who were classified as needing the Lab 99 were allowed to exceed the normal maximum credit load of eighteen credit hours.

Any students who had difficulty in completing the objectives of freshman mathematics and English during the fall quarter were allowed and encouraged to add Lab 99 for the winter quarter. The same situation prevailed during the winter and spring quarters.

ADAPTING BLOOM'S MODEL

Lab 99 is, in essence, a means to give students sufficient time and appropriate help to allow for mastery (1:4). A five-hour time block is provided for students unable to meet the entrance criteria for English or mathematics. A student who shows weakness in both areas has ten hours reserved. In the laboratory, a number of instructional techniques are used. Included are small-group sessions, independent study, programmed materials, audio tapes, tutoring, and other aids tailored to fit individual needs. Lab 99 sections are managed by the same instructor who teaches the students in the regular course section.

In the lab, the traditional classroom setting is replaced by the learning laboratory, a small-group setting, the library, and the instructor's office. Indeed, the total learning resources of the college are used to enable the student to master the task at hand. For example, those students with difficulty in reading receive help from a reading specialist during their 99 session. Student tutors are used on a limited basis under the direct supervision of the instructor. Under these circumstances, the instructor becomes truly a "manager of learning" and not the center of attention.

The laboratory approach goes to the very heart of Bloom's mastery concept, which affirms that "our basic task is to determine what we mean by mastery of the subject and to search for the methods and materials [that] will enable the largest proportion of our students to attain such mastery" (1:1). Each instructor in mathematics and English at Virginia Highlands has determined what he means by mastery of his course. The course objectives are defined in measurable terms, and mastery is determined through formative and summative evaluative procedures. Lab 99 provides alternative methods

and materials as avenues to mastery for those students who are not achieving the course objectives during the regular class time.

APTITUDE VERSUS ACHIEVEMENT

In its approach to developmental education, Virginia Highlands accepts Bloom's stance that aptitude is the amount of time required by the learner to attain mastery of a learning task (1:3). It follows, then, that a large number of students with weaknesses will need increased time to achieve mastery of a learning task. The time is provided in the English and mathematics laboratories.

This approach is philosophically attuned to one of the beliefs inherent in the community college philosophy: allowing the student to begin at his present level of achievement and providing a way for him to complete his curriculum successfully. It is a realistic approach; the students are counseled to take the laboratory sections. Moreover, the administration's support of the concept is shown by its recognition of faculty involvement in the laboratory experience as a legitimate instructional load. This in turn provides an incentive for the faculty to try innovative individualized modes of teaching the academically disadvantaged student. Therefore, neither students nor instructors are asked to "work miracles" by demanding that an academically weak student master *more* learning tasks in the same time period as the academically stronger student requires to master fewer tasks. The exit goals are the same for each student, but the time to reach them must vary if the weaker student is to have additional time for mastery.

UNDERSTANDING INSTRUCTION

Bloom states that "the ability to understand instruction may be defined as the ability of the learner to understand the nature of the task he is to learn and the procedures he is to follow in the learning of the task (1:5). Logically, the student with certain weaknesses in a subject field is less likely to understand instruction than is the student without them. Traditionally, since class time is devoted to presenting instruction that can be understood by the middle group of the class, both the slower and the brighter students suffer.

The approach used at Virginia Highlands allows the slower student to get a better understanding of instruction when meeting with the instructor in the Lab 99 sessions. In his own outline of a strategy for mastering learning, Bloom advocates

supplementing regular group instruction by using alternative instructional materials, methods, and diagnostic procedures to allow students to achieve a predetermined standard (1:8). At Virginia Highlands, Lab 99 is where the diagnostic procedures employed in the lecture session are translated into meaningful learning experiences for the students needing help beyond the regular classroom session. The small groups, various approaches to instruction, individual attention, and the longer time period are, we believe, the necessary ingredients for mastery for those enrolled in the laboratory sections.

Bloom suggests that formative evaluation is one approach to learning for mastery. Formative evaluation refers to brief diagnostic-progress tests that are used to determine whether the student has mastered a unit and, if not, what he can do about it. In Bloom's words, "the formative tests should reinforce the learning and assure the student that his present mode of learning and approach to study is adequate." Moreover, formative tests should reveal points of difficulty that are preventing the student from achieving mastery of a particular objective. Bloom suggests that "the *diagnosis* should be accompanied by a very specific *prescription* if students are to do anything about it" (1:9).

At Virginia Highlands, both freshman mathematics and English composition courses lend themselves to constant formative evaluation because each course uses assessable objectives. Indeed, formative evaluation must be at the center, not on the periphery, of the learning process if the laboratory approach discussed here is to function effectively. The instructor must continually "write the prescription" for curing the student's ills. Furthermore, he must be prepared to "fill the prescription" once the student enrolls in a laboratory section. The formative evaluation may or may not involve a grade, depending on the learning task the individual instructor wishes to accomplish with the particular objective or objectives. However, if the tasks are graded and the student does poorly, he is given a chance to master the particular learning task during the laboratory session and is therefore not forced to "accept a C as his 'fate'"(1:10).*

The student receives a grade in the lecture section, but does not receive one in the laboratory section. Lab 99 is provided for learning for mastery and is "graded" only

*Bloom fears that many students reconcile themselves to receiving a C and therefore do not attempt to achieve a higher level of mastery.

in the sense of determining whether the student has mastered the learning task with which he is having difficulty. (The student does receive an "S" or "U" grade, but it indicates only whether he participated in the lab and is not considered in the computation of quality credit averages.)

Although Lab 99 has a five-hour time block reserved for each section of the courses under discussion, it is not necessary for a student to attend five hours. Bloom notes that "one basic problem for a mastery learning strategy is to find ways of reducing the amount of time required for the slower students to reach a point where it is no longer a prohibitively long and difficult task for these students" (1:4). While students are expected to spend as much time in Lab 99 as needed for mastery, they are not tied to a set schedule. Some weeks they may need the full five-hour block to master the tasks at hand; at other times they may already have a grasp of the subject and need less than the five hours of laboratory work.

It should be emphasized here that Lab 99 is not a "free lab," which the student may or may not attend as he chooses. It is a period in which the instructor deals with the "academic ills" he has diagnosed during the regular class time. This is made clear to each student. Regular attendance in the labs is encouraged, but Lab 99 maintains a positive approach to mastery. Once the instructor and student have determined (through formative and summative evaluation) that the student no longer needs the laboratory, he is no longer enrolled. As suggested earlier, although he officially drops the laboratory at the end of the quarter, he may stop coming to the laboratory, with the permission of the instructor, any time he can show that he is mastering the assigned learning tasks without additional time and guidance. Having to use only the time needed is a motivating factor for students, for they wish to reduce the time required for mastery.

RESULTS AND OBSERVATIONS

In all, 109 students were involved in the Lab 99 program during its first year of operation—approximately one-fifth of the total college enrollment. Seventy-eight of them were enrolled in Lab 99 the first quarter. The remaining 31 entered at the beginning of the winter or spring quarters.*

*One must be careful not to extrapolate the following results beyond the present case at this time. These are the results of an evolving approach to developmental education and are presented to stimulate further investigation and to offer observations and trends, not to give definitive conclusions.

Roueche states that, in a recent study, 40 to 60 per cent of the students enrolled in remedial English classes received "D" or "F" in the remedial classes, and only 20 per cent of them went on to enroll in college credit courses (4:13). In contrast, 81 per cent of the students enrolled in Lab 99 the first quarter achieved a "C" or better in the college credit course associated with the 99 section; 27 per cent of them made a "B" or better. Moreover, *all* the students were receiving college credit for the courses while enrolled in Lab 99.*

In many developmental programs, a high attrition rate is the norm, but 76 per cent of the students who enrolled in the Lab 99 fall quarter were still enrolled in the college at the end of the spring quarter. Fifty per cent had been excused from the laboratory section at the end of the fall or winter quarters. Twenty-six per cent remained in Lab 99 for the entire academic year. It should be noted that 50 per cent were able to drop Lab 99 and not one "trailer" (new) section was begun to meet the needs of students who had completed their developmental work. Instead, the students simply dropped the laboratory and used the free time to take another course or to have additional study time for their other subjects.

In contrasting those students who remained in Lab 99 all three quarters with those who were excused after the first quarter, one notes several interesting trends. The group that was excused was far stronger as measured by their total grade point average. Seventy-two per cent of those who did not continue Lab 99 beyond the winter quarter had a grade point average of "C" or better in their total college program at the end of the academic year. Only 50 per cent of the group that remained in Lab 99 the entire year had an overall grade point average of "C" or better.

When one isolates the subjects associated with Lab 99, one finds that, of those who took 99 the entire academic year, half the group had a better grade in the 99-related subject at the end of the spring quarter than they had at the end of the fall quarter. In this group, one-fourth of the students had a poorer grade in the 99-related subject at the end of the fall quarter.

There is a marked contrast between the group of students who took Lab 99 all year and the group that was excused from it after one quarter. Only 16 per cent of the latter group had a better grade in the 99-related subject at the end of the spring

*See the Summary of Results, page 13, for more details.

quarter than they had at the end of the fall quarter. And 58 per cent had dropped one or more letter grades in the 99-related courses between the end of the fall quarter and the end of the spring quarter.

Significantly, by the end of spring quarter, the group of students still enrolled in Lab 99 had a higher group average in the 99-related subjects than did those who had started Lab 99 fall quarter and were later excused. It is worthy of note that 40 per cent of the group in Lab 99 spring quarter made a "B" or better in the 99-related course; only 20 per cent of the group that had been excused made a "B" or better in the same course for the same quarter.

SUMMARY

Bloom states that a "strategy for mastery learning must find some way of solving the instructional problems as well as the school organization (including time) problems" (1:7). We have found that the approach discussed above provides a way to solve both instructional and organizational problems. By defining the course objectives in measurable terms, the instructor is becoming more adept at determining mastery; by using a number of instructional methods, he gives the student different avenues for learning. The laboratory, with its three hours of credit, even fits nicely into the registrar's guidelines. As federal and state agencies accept hours earned in Lab 99 as constituting a legitimate part of the students' credit load, this eliminates the problem of determining whether a student enrolled in a foundations program can be considered a full-time student.

At the present time, evidence regarding results of this approach to developmental education is limited, but the positive features outweigh the negative. Both students and instructors have been encouraging in their acceptance and use of the concepts developed in this presentation. Indeed, it is not unusual to find students who have not signed up for the laboratory dropping in to do additional work or to work with students who are having problems.

POSTSCRIPT

While the primary purpose of this approach to developmental education at Virginia Highlands is to provide avenues for the mastery of the task at hand, we believe it has other significant benefits.

In contrast to the approach often used in developmental programs, the first and most obvious benefit is that the student is making progress toward graduation in his chosen curriculum. Also, if he no longer needs the laboratory at the end of a quarter, he may use that time to enroll in an elective course or in a nonsequential course required in his program.

The student is enrolled in the same English and mathematics courses as his peers. This eliminates the "isolated" feeling he often has if he is enrolled in a "full foundations" curriculum and also helps to remove the stigma traditionally attached to him as a developmental student.

The student is allowed to progress at his own speed. The Carnegie Commission on Higher Education noted a need for this type of program in developmental education. The Commission states that "there is a need for programs [that] encourage the student to develop at his own pace and in which his own progress (and needs) rather than adherence to a set schedule becomes the criterion for success" (2:22). We agree with this recommendation. The approach described above allows it to be implemented.

To be successful, any program of developmental education must have readily available avenues leading from the developmental program into the courses or curriculum for which the student is being prepared. In the small or medium-size college, it is neither educationally nor economically feasible to provide "trailer" sections each quarter for those few students who are ready to move out of the foundations program. Since the students may drop the laboratory course when they no longer need additional work, there is no need for "trailer" sections. Nor is there any temptation to keep students in a foundations curriculum longer than actually needed simply because there is "no place for them to go."

The approach described above has helped to develop an attitude toward learning for mastery that is shared by both administration and faculty. Moreover, students are being exposed to the concept of mastery—a concept that is new to many recent high school graduates.

By allowing the student to receive additional time and help in mathematics and English, the entire concept of *demanding* prerequisites for English composition and general college mathematics is subject to question. It is likely that a highly motivated student might be expected to complete satisfactorily a course in

freshman composition without having "successfully completed four units of high school English." This approach seems worthy of consideration by those community colleges that would like to explore the feasibility of open curriculums as well as of open doors.

The small college with limited enrollment will find it difficult financially to expand the above approach to many *courses*, but it appears to be applicable to any number of *subjects*.

Lab 99 encourages faculty members to try innovations without fear of having them result in increased teaching loads.

The approach assumes that the student who has met the course prerequisites knows *something* about the mathematics and English courses required in his college curriculum. It is absurd to assume that a student who has just completed four units of high school English knows *no* grammar, yet the traditional approach to foundations often tends to "go back to the beginning" in dealing with a student's weaknesses.

The "burden of proof" of achievement in a course is shared by the instructor and the student. If a student fails, the instructor must know why he failed, for each student who enrolls in a laboratory in English and mathematics does so under the direction of the same instructor who teaches him in the lecture section. Using this method, neither the instructor nor the student can use as an excuse for failure any lack of time to reach the objectives of the course. For instructors who have stated too often that they could teach the academically weaker student if they had the necessary time, this plan provides it.

Each instructor must define what objectives he wishes the student to achieve in his course. Without objectives, he has no right to pass or fail any student.

The question of non-punitive grading has been and is being discussed among community college educators. Using the Lab 99 approach, non-punitive grading can be accomplished without starting new sections ("trailer" sections) for the student who fails to meet the objectives of a given course during the time normally allotted. A student, under this approach, would be able to complete the objectives of a course offered in the fall quarter by adding a Lab 99 section in the winter quarter. His grade for the fall quarter would be an incomplete (or some similar designation

showing that the objectives for the course were not completed) and he would receive a grade of "C" or better once he completes the objectives of the course.

At the beginning of this paper, it was suggested that Bloom has made an important statement on learning. We believe that he has stimulated both thought and action for developing a model for meeting more student needs. Moreover, we believe that the foregoing discussion does present an emerging model, allowing the open door to remain open for students who fail to meet the entry level criteria for college credit courses or who find themselves in academic difficulty once they have enrolled.

SUMMARY OF RESULTS

Group I — Students who were assigned to Lab 99 during their first quarter.

- Case A — These students were excused from Lab 99 after the first quarter, but remained in college throughout the year.
- Case B — These students also took Lab 99 their second quarter, but were excused from the Lab 99 the third quarter.
- Case C — These students took Lab 99 all three quarters.
- Case D — These students withdrew from college before the completion of the year.

	Case A	Case B	Case C	Case D
Number in case	25	14	20	19
Overall quality credit average				
3.00–3.99	1	1	6	1
2.00–2.99	17	4	4	4
1.00–1.99	6	9	9	8
0.00–0.99	1	0	1	6
Students achieving grade of C or better in Lab 99-related course.				
First quarter	25	12	14	12
Last quarter	16	6	16	–
Grade of B or better				
First quarter	12	2	4	3
Last quarter	5	2	8	–

Group II — Students who were *not* in Lab 99 during their first quarter, but who did take it later in their program. These students were enrolled in the Lab 99-related course, without the lab, during their first quarter.

- Case E — These students took Lab 99 during both their second and third quarters.

Case F — These students took Lab 99 during their second quarter but either did not return to college in their third quarter or did not continue in Lab 99.

Case G — These students did not add the Lab 99 until their third quarter.

	Case E	Case F	Case G
Number in Case	11	16	4
Overall quality credit average			
3.00–3.99	1	1	0
2.00–2.99	2	8	2
1.00–1.99	5	6	2
0.00–0.99	3	1	0
Students achieving grade of C or better in Lab 99-related course			
First quarter	4	12	1
Last quarter*	5	13	3
Grade of B or better			
First quarter	0	3	0
Last quarter*	1	2	1

*Second quarter for Case F

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